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General Notes.

MINERALOGY.¹

Contact Goniometer with two Graduated Circles.—In pursuance of the idea already applied to the reflection goniometer (ref. in this journal, 1895, p. 266) Goldschmidt² has designed a contact goniometer with two graduated circles. The horizontal circle carries the support for the crystal, which can thus be rotated about a vertical axis. The vertical circle is a metallic band carrying a moveable block. Through the block a small metal rod passes radially toward the center, and on the inner end of the rod a small plate is fixed. By movement of the crystal about its vertical axis and of the block on its arc, the plate may be brought to parallelism with any face on the upper side of the crystal. Actual contact of the plate with the crystal face is effected by sliding the rod through its block. Readings on the two circles give data for computing the position of a plane, exactly as in the case of the reflection goniometer to which reference was above made.

Crystallographic Properties of the Sulphonic Acid Derivatives of Camphor.—About 17 of these compounds are mentioned by Kipping and Pope³ with much detailed information concerning the crystallography of several of them. As might be expected from the fact that the solutions of many of these substances exhibit the phenomenon of circular polarization, the crystals furnish examples of a number of the less common low symmetry grades. Among these are hemimorphism in the monoclinic system (sphenoidal class of Groth), sphenoidal hemihedrism in the orthorhombic system (bisphenoidal class), and probably hemihedrism in the triclinic system (pedial class). Such crystallographic studies must be of great value to stereo-chemistry.

Optical Properties of Lithiophilite and Triphilite.—On these two minerals Penfield and Pratt⁴ have based an interesting investigation of the change of optical properties due to the mutual replacement of manganese and iron in isomorphous mixture. It is found

¹ Edited by A. C. Gill, Cornell University, Ithaca, N. Y.

² Zeitschr. f. Kryst., XXV, p. 321, 1895.

³ Zeitschr. f. Kryst., XXV, pp. 225-256, 1895.

⁴ Am. Jour. Sci., L, pp. 387-390, Nov., 1895.

that with increasing percentage of iron the index of refraction increases, while the plane of the optical axes is changed from the base (001) to the macropinacoid (100). A specimen containing 26.58% FeO shows an optical angle of $21^{\circ} 53'$ in the basal plane for thallium light, is *uni-axial* for sodium light, and has an angle of $15^{\circ} 3'$ in the macropinacoid for lithium—a remarkably good example of orthorhombic dispersion. With 35.05% FeO the crystals are found to be negative, whereas those with less iron are optically positive. It is suggested that in the pure manganese molecule, the change may be found so great that the brachypinacoid is the plane of the optical axes.

Native Sulphur in Michigan.—Scherzer⁵ reports an occurrence of sulphur a mile west of Scofield, Monroe Co., Michigan. It is found in a stratum of impure cavernous limestone about one to three feet in thickness. The pockets, varying from a fraction of an inch up to three feet in diameter, are often lined with calcite and celestite crystals with bright lustrous masses of sulphur toward the center. The removal of about an acre of this bed has yielded 100 barrels of pure sulphur. The sulphur seems to have originated from hydrogen sulphide which is abundant in the waters of the neighborhood. The hydrogen sulphide, in turn, may be a product of decomposing organic matter.

Leadhillite Pseudomorphs at Granby, Mo.—The occurrence of leadhillite at Granby in the form of pseudomorphs after calcite and galena is made the subject of a note by Foote.⁶ Scalenohedrons in a chert calamine rock are composed usually of pure cerussite; more rarely the substance is found to be leadhillite. Galena cubes replaced by leadhillite were also observed. In these cases the secondary mineral is usually mixed with remnants of the original galena, producing a "gray amorphous mass." In a few specimens the leadhillite is pure.

Celestite from Giershagen.—According to Arzruni and Thaddeef⁷ the axial ratio of "normal" celestite is $a:b:c = .78093:1:1.28324$. The mineral from Giershagen, which appears to be chemically pure Sr SO_4 , has the ratio $a:b:c = .77962:1:1.28533$. The mean of four determinations places the specific gravity at 3.9665. The optical angle of "normal" celestite is given as $2 V_{aNa} = 50^{\circ} 34'$. This investigation adds another to the list of chemically pure compounds whose

⁵ Am. Jour. Sci., L, pp. 246-248, Sept., 1895.

⁶ Am. Jour. Sci., L, p. 99, August, 1895.

⁷ Zeitschr. f. Kryst., XXV, pp. 38-72, 1895.

molecular volume may be considered as accurately known, and allows of comparison between the various physical constants of this and isomorphous substances.

Minerals from the Galena Limestone.—Hobbs⁸ gives a detailed description, with many drawings, of the crystallized minerals from the galena limestone of southern Wisconsin and northern Illinois. The habitus of the various crystals is made prominent in the discussion of them. New forms are reported on calcite (24.0.24.1), on cerussite (0.25.4), and on azurite (307), (203), (205) and (9.12.8).

Miscellaneous Notes.—Becke⁹ shows that the center of symmetry may be used as a fundamental conception in developing the 32 classes of crystal symmetry, notwithstanding the fact of its abandonment by Groth and Fedorow.—Sylvite from Stassfurt, investigated by Schimpff¹⁰ with special reference to the impurities of the same, gave K Cl 99.239, Na Cl .242, Mg Cl₂ .089, Ca SO₄ .073, H₂S .0023, residue .108, loss on melting .2847. The foreign substances seem to occur chiefly as inclusions with the mother liquor. These figures doubtless give a very good idea of the amount of impurity present, but the extreme right hand digits must be looked upon as mathematics rather than chemistry.—Igelström¹¹ finds molybdenum, probably present as Mo₂O₃, in the hematite from the "Sjögrube," Gouv. Örebro, Sweden. One specimen of the same material showed spectroscopically the presence of thallium.—Niven¹² notes the discovery on New York Island of numerous interesting specimens of the rare earth minerals xenotime and monazite. Titanite, epidote, beryl and menaccanite are also mentioned.—The mineral named schneebergite by Brezina¹³ on the basis of an apparently faulty qualitative investigation is shown by Eakle and Muthmann¹⁴ to be in reality a very pure lime-iron garnet, or topazolite, instead of a calcium antimonite. The specific gravity is 3.838, and the chemical composition:

⁸ Zeitschr. f. Kryst., XXV, pp. 257-275, 1895.

⁹ Zeitschr. f. Kryst., XXV, pp. 73-78, 1895.

¹⁰ Zeitschr. f. Kryst., XXV, p. 92, 1895.

¹¹ Zeitschr. f. Kryst., XXV, p. 94, 1895.

¹² Am. Jour. Sci., L, p. 75, July, 1895.

¹³ Vehr. d. k. k. geol. Reichsanstalt, 1880, p. 313.

¹⁴ Zeitschr. f. Kryst., XXV, pp. 244-246, 1895.

	found		calculated for
			$\text{Ca}_3\text{Fe}_2\text{Si}_3\text{O}_{12}$
SiO_2		35.45	35.43
Fe_2O_3	32.33	32.11	31.50
CaO	32.58		33.07

— Foote¹⁵ gives some details concerning a new mineral which he proposes to name Northupite. It was found by Mr. Northup in the “tailings” from a boring made at Borax Lake, Cal. The crystals are regular octahedrons reaching rarely 1 cm. in diameter. The substance seems to be a double chloride and carbonate of sodium and magnesium. Cleavage imperfect, $H = 3.5$ to 4.

PETROGRAPHY.¹

Volcanic Rocks and Tuffs in Prussia.—In the hills east of Ebsdorf, near Marburg, Prussia, are large areas covered by basalt flows, flows of dolerite, and others of rocks intermediate in character between these two, both of which are pre-Tertiary in age, or at any rate are older than the Tertiary beds with which they are associated. The volcanic rocks are cut by dykes of very basic rock resembling limburgite. The little hill west of Wittelsberg, near the northern edge of the basalt area, and the flank of the hill near Kehrenberg, are composed largely of basalt tuff.

The basalt consists of phenocrysts of augite and olivine in a dense felt of augite microlites, biotite and magnetite, in the spaces between which is a colorless glass containing xenomorphic feldspar, leucite and nepheline. Inclusions in the basalt are very common. They comprise besides fragments of foreign rocks, concretions of olivine and of augite. The olivine concretions always contain more or less bronzite, and usually they are surrounded by a violet-brown rim similar to the rims found surrounding the augite phenocrysts in the basalt. Even those concretions that are composed almost exclusively of bronzite are surrounded by rims of this character. The principal component of this rim is a monoclinic augite, so that it appears here that the bronzite, which must have been one of the earliest separations from the magma, was, after its crystallization, changed into augite. Other concretions show the

¹⁵ Am Jour. Sci., L, pp. 480-488, Dec., 1895.

¹ Edited by Dr. W. S. Bayley, Colby University, Waterville, Me.